

4 Water is an important molecule in living organisms.

(a) Water is a dipolar molecule that forms hydrogen bonds with other water molecules.

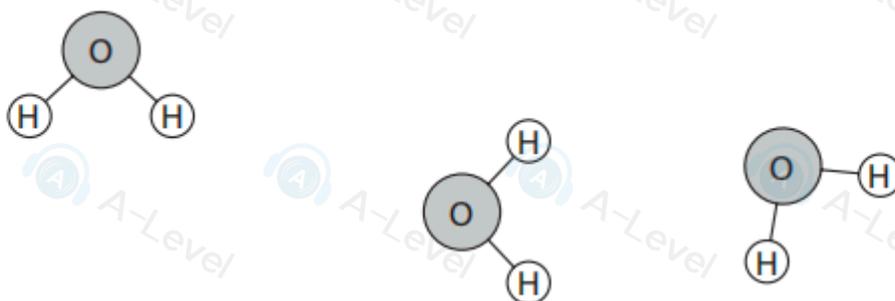
(i) Explain the dipole nature of water.

(2)

(ii) The diagram shows three water molecules.

Complete the diagram to show a hydrogen bond between two water molecules.

(1)



(b) Water plays a role as a solvent.

Sodium chloride dissolves in water.

The diagram shows a sodium ion (Na^+).

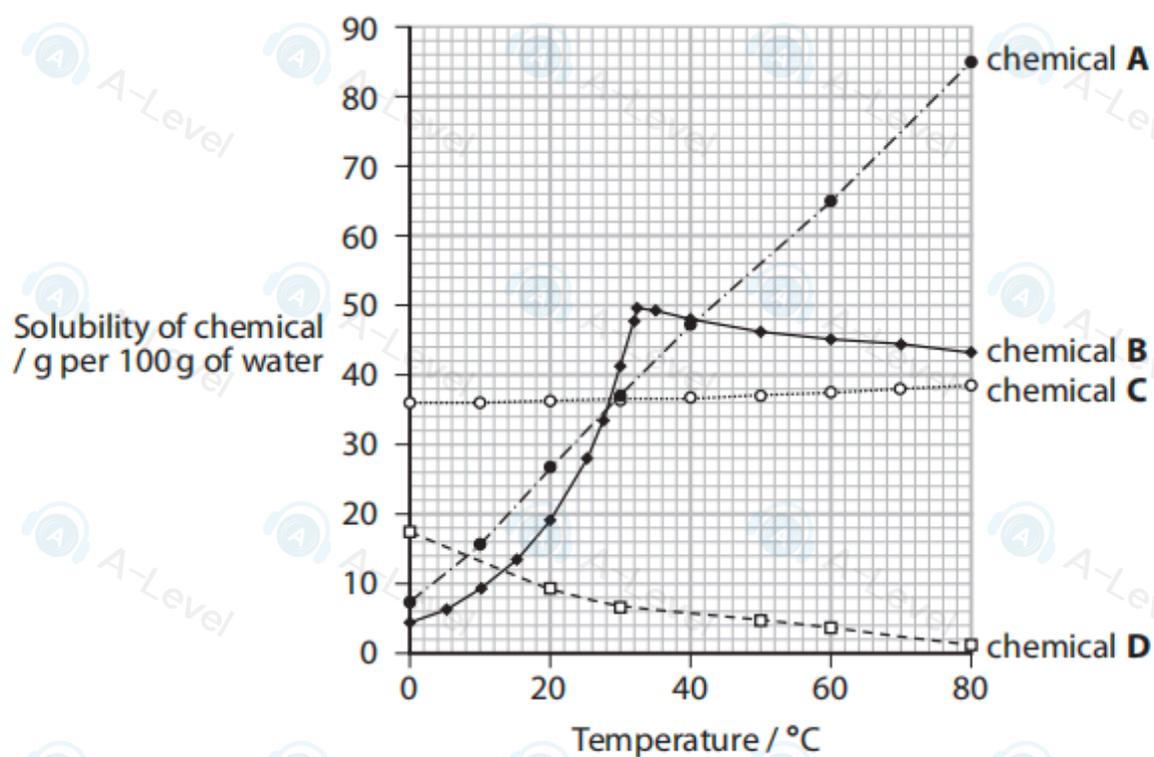
Complete the diagram to show the arrangement of two water molecules around a sodium ion when it is dissolved.

(1)



(c) Temperature affects the solubility of chemicals in water.

The graph shows the effect of temperature on the solubility of four chemicals, **A, B, C** and **D**.



Describe the effects of temperature on the solubility of these chemicals.

(4)

Four sets of horizontal dashed lines for writing the answer.

(Total for Question 4 = 8 marks)

Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 Water is an important biological molecule.

Read through the following description of water.

Complete the description by writing the most appropriate word on the dotted lines.

Water has an uneven charge distribution so it is described as a

..... molecule. The hydrogen ends of the molecule

have a very slightly charge.

Water is involved in the transport of substances so it is an important

..... in living organisms.

Water is needed in chemical reactions called

reactions that break down disaccharides such as

..... into glucose and galactose.

(Total for Question 1 = 5 marks)
